ABSTRACT

An integrated circuit copper interconnect structure is formed by forming a dielectric layer (90) over a semiconductor substrate (10). Trenches (110) and vias (120) are formed in the dielectric layer (90) and a barrier layer (130) is formed in the trenches (110) and vias (120) using material such as iridium, iridium oxide, ruthenium, ruthenium oxide, rhodium, rhodium oxide, rhenium, rhenium oxide, platinum, platinum oxide, palladium and palladium oxide. Copper (147) is then used to fill the remaining area in the trenches (110) and vias (120).